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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103**

SUBJECT: ^{Assessment} Risk Estimates for Galaxy/Spectron Stream: May 2000 Data

FROM: Jennifer Hubbard, Toxicologist
Technical Support Section (3HS41)

TO: Randy Sturgeon, RPM
General Remedial Section (3HS23)

DATE: 7/12/2000

I have estimated the risks from exposure to volatile organic compounds (VOCs) in Little Elk Creek, as requested. These estimates are based on unvalidated data from the May 2000 sampling event. Because the data are unvalidated, these estimates could require adjustment after validation. A high bias is more likely than a low bias.

The maximum concentrations from the sampling were used, which also leads to a high bias. For children swimming 30 days/year, 2.6 hours/day, for 6 years, the risks would be estimated as follows:

	Hazard Index	Cancer Risk
Incidental ingestion	1.4E-3	1.6E-7
Skin exposure	5.1E-3	3.6E-7
Inhalation	7.2E-4	2.2E-8
Total	7.2E-3	5.4E-7

To estimate whether nearby residents could be exposed to unacceptable risks via inhalation, vapor concentrations 100 feet from the stream were modeled. The resulting residential risks are as follows:

	Child Hazard Index	Adult Hazard Index	Cancer Risk
Child resident-inhalation	0.03	--	9.6E-7
Adult resident-inhalation	--	0.01	1.4E-6
Total	0.03	0.01	2.4E-6

At Hazard Indices below 1, adverse non-cancer health effects are not typically expected. EPA's target cancer risk range is 1E-6 to 1E-4; the risks in this memo are at the lower end of, or below, that range. These risks are likely to be lower than reported, because of the conservative assumptions in using maximum concentrations (for residents, these were annual air averages based on maximum stream concentrations).

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The calculations and assumptions that support these estimates are in the attached pages. Ms. Patricia Flores-Brown performed the air modeling estimates. The exposure factors were based on EPA's 1997 Exposure Factors Handbook and the 1991 Standard Default Exposure Factors, adjusted to be consistent with the 1997 Spectron stream assessment. The toxicity factors were obtained from the Integrated Risk Information System, the Health Effects Assessment Summary Tables, or the National Center for Environmental Assessment (in that order of preference). The dermal exposure factors were obtained from the 1992 Dermal Exposure Assessment guidance. (Acetone's dermal factors were estimated using a molecular weight of 58 g/mol and a log Kow of -0.24, obtained from the Hazardous Substances Data Bank. The factors for cis-1,2-DCE were based on trans-1,2-DCE.)

If you have any questions concerning this assessment, please contact me at x3328.

Attachments: 5

cc: Eric Johnson (3HS41; w/o attach.)
Pat Flores-Brown (3HS41, w/o attach.)

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